



DEPARTMENT OF THE AIR FORCE
59TH MEDICAL WING (AETC)
JOINT BASE SAN ANTONIO - LACKLAND TEXAS



31 JULY 2017

MEMORANDUM FOR SGVT

ATTN: CAPT SIERRA MUSICK

FROM: 59 MDW/SGVU

SUBJECT: Professional Presentation Approval

Your paper, entitled **Chondroblastic Osteosarcoma Presenting as a Pulmonary Embolism** presented at/published to **Archives of Pathology, College of American Pathologists CAP17 The Pathologists' Meeting, Gaylord National, Maryland, October 8-11 2017** in accordance with MDWI 41-108, has been approved and assigned local file #**17298**.

Pertinent biographic information (name of author(s) title, etc.) has been entered into our computer file. Please advise us (by phone or mail) that your presentation was given. At that time, we will need the date (month, day and year) along with the location of your presentation. It is important to update this information so that we can provide quality support for you, your department, and the Medical Center commander. This information is used to document the scholarly activities of our professional staff and students, which is an essential component of Wilford Hall Ambulatory Surgical Center (WHASC) internship and residency programs.

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Congratulations, and thank you for your efforts and time. Your contributions are vital to the medical mission. We look forward to assisting you in your future publication/presentation efforts.

Linda Steel-Goodwin

LINDA STEEL-GOODWIN, Col, USAF, BSC
Director, Clinical Investigations & Research Support

PROCESSING OF PROFESSIONAL MEDICAL RESEARCH/TECHNICAL PUBLICATIONS/PRESENTATIONS

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Chondroblastic Osteosarcoma Presenting as a Pulmonary Embolism

Authors: Sierra Musick, MD, David T Lynch, MD, Gabriella Cardoza-Favarato, MD

Introduction

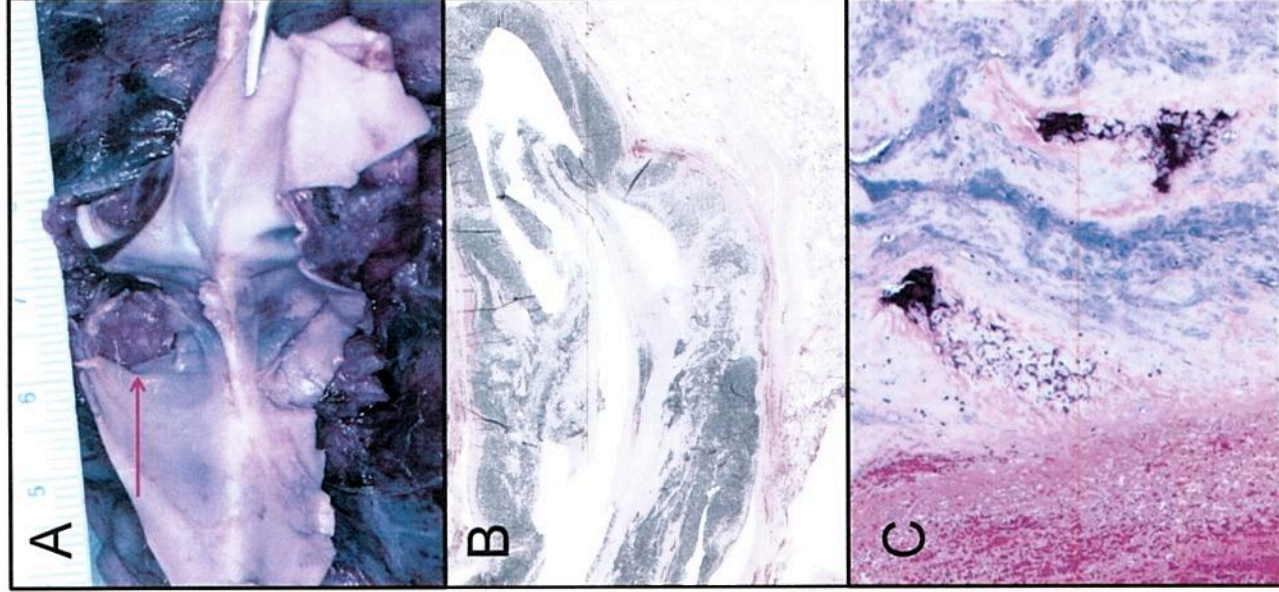
Osteosarcomas are more common in younger adults; however, extraskeletal osteosarcomas are more likely in older adults. Extraskeletal osteosarcoma is defined as a malignant mesenchymal neoplasm that produces varying amounts of osteoid, immature bone or chondroid matrix, located in the soft tissue without connection to the skeleton. The retroperitoneum, deep muscles of the thigh, pelvis and shoulder girdles are common locations. These tumors tend to be highly aggressive with only a 20% average 5-year survival rate.

These lesions are thought to represent the progression of soft tissue or epithelial malignancies. Rarely, extraskeletal osteosarcomas have been known to occur in the heart and the pulmonary arteries, the latter of which can present as a pulmonary embolism. They are highly aggressive and commonly metastasize to the lungs. We report a case of a woman found to have chondroblastic osteosarcoma in her heart and pulmonary arteries.

Case Report

A previously healthy 63-year-old woman presented with several weeks of shortness of breath and fatigue was diagnosed with a massive pulmonary embolism. On imaging, she was diagnosed with occlusion of the right segmental pulmonary arteries and multifocal pulmonary infarcts of the right lung. A biopsy of the suspected pulmonary embolism showed minute fragments of thrombus with admixed inflammatory cells, but was negative for malignancy. The clinical team's suspicion for malignancy persisted given the lack of response to anticoagulation and thrombolysis. However, a full body positron emission tomography (PET) scan did not reveal any malignant foci. Upon pulmonary artery embolectomy, a mass was identified. The pulmonary artery mass frozen specimen was a white-tan-red glistening multinodular firm mass with a cut surface revealing solid and cystic areas with a gelatinous appearance. Histologically, it was reported as an atypical osteocartilaginous neoplasm, which prompted a unilateral pneumonectomy. Grossly, the pneumonectomy specimen demonstrated the mass occluding multiple large and small pulmonary vessels (Figure A).

On permanent sections, a neoplasm in the pulmonary artery and lung showed lobules of neoplastic cartilage with surrounding and intervening spindle cells, osteoid and bone (Figure B and C). The mitotic rate was greater than 20/10 HPFs and the histological grade was 3. Direct chest wall extension and lympho-vascular invasion were also identified. Necrotic chondroid tissue was found in the tricuspid valve vegetation. Undifferentiated malignant spindle cells were found in the pulmonary valve vegetation. Further imaging and physical exam revealed no other site of tumor.



Pathology

Figure A. Gross examination of pneumonectomy specimen with large pulmonary vessel containing the mass (red arrow).

Figure B. Hematoxylin and eosin histopathologic evaluation demonstrating the neoplasm in the pulmonary artery.

Figure C. Hematoxylin and eosin histopathologic evaluation showing neoplastic spindle cells, osteoid and bone next to an area of hemorrhage and necrosis.

Discussion

Extraskeletal osteosarcoma comprise only 1% to 2% of all soft tissue sarcomas (3). They typically occur in patients older than 40 years of age with no clear sex predilection. Common locations include the lower extremity, particularly the thigh, the upper extremities and the retroperitoneum. Rarely, extraskeletal osteosarcomas have been known to occur in the heart, pulmonary pleura, pulmonary arteries, mediastinum, mesentery, omentum and esophagus. Those arising in the lung are especially rare, with the first case report in 1933 (1).

Production of osteoid or bone by cytological malignant cells is required for diagnosis (2). Histologically, extraskeletal osteosarcomas resemble undifferentiated pleomorphic sarcomas with the addition of osteoid. Atypical cartilage, if present, rarely predominates, as was the case in this patient's tumor. Given the hypothesis that these lesions represent the progression of soft tissue or epithelial malignancies, it is most likely that this patient's tumor arose from the pulmonary arteries and subsequently spread to the cardiac valves in the form of vegetations.

Alternatively, this tumor could have been a metastasis. However, this is unlikely given the full body positron emission tomography (PET) scan did not reveal any malignant foci. The differential diagnosis should include other malignant tumors that may have metaplastic bone formation, such as epithelioid sarcoma, synovial sarcoma, mixed malignant müllerian tumor (MMMT) and malignant melanoma. The patient had no history of malignancy and therefore was diagnosed with intravascular and parenchymal metastatic chondroblastic osteosarcoma with the suspected site of origin being the lung vasculature. This case highlights an uncommon presentation of a diagnostically challenging case of chondroblastic osteosarcoma.

References

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Osteosarcomas are more common in younger adults; however, extraskeletal osteosarcomas are more likely in older adults. Rarely, osteosarcomas have been known to occur in the heart and the pulmonary arteries, the latter of which can present as a pulmonary embolism. They are highly aggressive and commonly metastasize to the lungs. We report a case of a woman found to have chondroblastic osteosarcoma in her heart and pulmonary arteries. A previously healthy 63-year-old woman presented with several weeks of shortness of breath and fatigue was diagnosed with a massive pulmonary embolism. On imaging, she was diagnosed with occlusion of the right segmental pulmonary arteries and multifocal pulmonary infarcts of the right lung. A biopsy of the suspected pulmonary embolism showed minute fragments of thrombus with admixed inflammatory cells, but was negative for malignancy. Upon pulmonary artery embolectomy, a mass was identified. The pulmonary artery mass frozen specimen was a white-tan-red glistening multinodular firm mass with a cut surface revealing solid and cystic areas with a gelatinous appearance. On permanent sections, a neoplasm in the pulmonary artery and lung showed lobules of neoplastic cartilage with surrounding and intervening spindle cells and osteoid (see image). Necrotic chondroid tissue was found in the tricuspid valve vegetation. Undifferentiated malignant spindle cells were found in the pulmonic valve vegetation. Imaging and physical exam revealed no other site of tumor. This case highlights an uncommon presentation of a diagnostically challenging case of chondroblastic osteosarcoma.

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